

IN THE CLAIMS

Please amend the claims to read as follows:

Listing of Claims

Claims 1-27 (Cancelled).

28. (Currently Amended) ~~The method according to claim 24~~ An
ARQ re-transmission method in a wireless communication system
wherein data packets are transmitted from a transmitter to a
receiver using a first transmission and at least a second
transmission based on a repeat request, the method comprising:
modulating data packets at the transmitter using a first
modulation scheme to obtain first data symbols;
performing the first transmission by transmitting the first
data symbols over a first diversity branch to the receiver;
modulating said data packets at the transmitter using a
second modulation scheme to obtain second data symbols;
performing the second transmission by transmitting the
second data symbols over a second diversity branch to the
receiver;
demodulating the received first and second data symbols at
the receiver using the first and second modulation schemes
respectively; and

diversity combining the demodulated data received over the first and second diversity branches, wherein:
the modulation schemes are 16 QAM and a number of $\log_2 (M)$ modulation schemes are used.

29. (Currently Amended) ~~The method according to claim 24~~ An ARQ re-transmission method in a wireless communication system wherein data packets are transmitted from a transmitter to a receiver using a first transmission and at least a second transmission based on a repeat request, the method comprising:
modulating data packets at the transmitter using a first modulation scheme to obtain first data symbols;
performing the first transmission by transmitting the first data symbols over a first diversity branch to the receiver;
modulating said data packets at the transmitter using a second modulation scheme to obtain second data symbols;
performing the second transmission by transmitting the second data symbols over a second diversity branch to the receiver;
demodulating the received first and second data symbols at the receiver using the first and second modulation schemes respectively; and

diversity combining the demodulated data received over the first and second diversity branches, wherein:

the modulation schemes for the first and second diversity branches are selected such that after combining the bits of the data packets the differences in magnitude among the combined bit reliabilities are reduced.

30. (Currently Amended) ~~The method according to claim 24~~ An ARQ re-transmission method in a wireless communication system wherein data packets are transmitted from a transmitter to a receiver using a first transmission and at least a second transmission based on a repeat request, the method comprising:
modulating data packets at the transmitter using a first modulation scheme to obtain first data symbols;
performing the first transmission by transmitting the first data symbols over a first diversity branch to the receiver;
modulating said data packets at the transmitter using a second modulation scheme to obtain second data symbols;
performing the second transmission by transmitting the second data symbols over a second diversity branch to the receiver;

demodulating the received first and second data symbols at the receiver using the first and second modulation schemes respectively; and

diversity combining the demodulated data received over the first and second diversity branches, wherein:

the data for transmission is modulated using a single redundancy version scheme with an identical data bit sequence.

31. (Currently Amended) ~~The method according to claim 24~~ An ARQ re-transmission method in a wireless communication system wherein data packets are transmitted from a transmitter to a receiver using a first transmission and at least a second transmission based on a repeat request, the method comprising:

modulating data packets at the transmitter using a first modulation scheme to obtain first data symbols;

performing the first transmission by transmitting the first data symbols over a first diversity branch to the receiver;

modulating said data packets at the transmitter using a second modulation scheme to obtain second data symbols;

performing the second transmission by transmitting the second data symbols over a second diversity branch to the receiver;

demodulating the received first and second data symbols at the receiver using the first and second modulation schemes respectively; and

diversity combining the demodulated data received over the first and second diversity branches, wherein:

the data for transmission is modulated using a multiple redundancy version scheme of partly identical bits.

32. (Currently Amended) ~~The method according to claim 24~~
An ARQ re-transmission method in a wireless communication system wherein data packets are transmitted from a transmitter to a receiver using a first transmission and at least a second transmission based on a repeat request, the method comprising:
modulating data packets at the transmitter using a first modulation scheme to obtain first data symbols;
performing the first transmission by transmitting the first data symbols over a first diversity branch to the receiver;
modulating said data packets at the transmitter using a second modulation scheme to obtain second data symbols;
performing the second transmission by transmitting the second data symbols over a second diversity branch to the receiver;

demodulating the received first and second data symbols at the receiver using the first and second modulation schemes respectively; and

diversity combining the demodulated data received over the first and second diversity branches, wherein;

the first and second modulation schemes are pre-stored in a memory table.

33. (Currently Amended) ~~The method according to claim 24~~
An ARQ re-transmission method in a wireless communication system wherein data packets are transmitted from a transmitter to a receiver using a first transmission and at least a second transmission based on a repeat request, the method comprising:
modulating data packets at the transmitter using a first modulation scheme to obtain first data symbols;
performing the first transmission by transmitting the first data symbols over a first diversity branch to the receiver;
modulating said data packets at the transmitter using a second modulation scheme to obtain second data symbols;
performing the second transmission by transmitting the second data symbols over a second diversity branch to the receiver;

demodulating the received first and second data symbols at the receiver using the first and second modulation schemes respectively; and

diversity combining the demodulated data received over the first and second diversity branches, wherein:

the first and second modulation schemes are signaled to the receiver.

34. (Currently Amended) The method according to claim 24 An ARQ re-transmission method in a wireless communication system wherein data packets are transmitted from a transmitter to a receiver using a first transmission and at least a second transmission based on a repeat request, the method comprising:

modulating data packets at the transmitter using a first modulation scheme to obtain first data symbols;

performing the first transmission by transmitting the first data symbols over a first diversity branch to the receiver;

modulating said data packets at the transmitter using a second modulation scheme to obtain second data symbols;

performing the second transmission by transmitting the second data symbols over a second diversity branch to the receiver;

demodulating the received first and second data symbols at the receiver using the first and second modulation schemes respectively; and

diversity combining the demodulated data received over the first and second diversity branches, wherein:

the properties of the first and second modulation schemes are obtained by one of:

(a) interleaving the positions of the bits mapped onto the data symbols, and

(b) inverting the bit values of the bits mapped onto the data symbols.

35. (Previously Presented) The method according to claim 34, wherein the interleaving is performed with symbols resulting in an intra-symbol interleaving.

36. (Currently Amended) ~~The method according to claim 24~~ An ARQ re-transmission method in a wireless communication system wherein data packets are transmitted from a transmitter to a receiver using a first transmission and at least a second transmission based on a repeat request, the method comprising:
modulating data packets at the transmitter using a first modulation scheme to obtain first data symbols;

performing the first transmission by transmitting the first data symbols over a first diversity branch to the receiver;

modulating said data packets at the transmitter using a second modulation scheme to obtain second data symbols;

performing the second transmission by transmitting the second data symbols over a second diversity branch to the receiver;

demodulating the received first and second data symbols at the receiver using the first and second modulation schemes respectively; and

diversity combining the demodulated data received over the first and second diversity branches, wherein:

the data is transmitted with a plurality of redundancy versions and bits of the transmitted bits data comprise systematic and parity bits and the systematic bits are included in each redundancy version.

37. (Currently Amended) The method according to claim 37 36, wherein the combined mean bit reliabilities for the systematic bits are higher than that of the parity bits.

38. (Currently Amended) ~~The method according to claim 24~~ An ARQ re-transmission method in a wireless communication system

wherein data packets are transmitted from a transmitter to a receiver using a first transmission and at least a second transmission based on a repeat request, the method comprising:

modulating data packets at the transmitter using a first modulation scheme to obtain first data symbols;

performing the first transmission by transmitting the first data symbols over a first diversity branch to the receiver;

modulating said data packets at the transmitter using a second modulation scheme to obtain second data symbols;

performing the second transmission by transmitting the second data symbols over a second diversity branch to the receiver;

demodulating the received first and second data symbols at the receiver using the first and second modulation schemes respectively; and

diversity combining the demodulated data received over the first and second diversity branches, wherein:

the first transmission comprises using the first modulation scheme and a third modulation scheme and transmitting the data modulated with the first and third modulation schemes over the first diversity branch and a third diversity branch.

39. (Currently Amended) The method according to claim 24 An
ARQ re-transmission method in a wireless communication system
wherein data packets are transmitted from a transmitter to a
receiver using a first transmission and at least a second
transmission based on a repeat request, the method comprising:
modulating data packets at the transmitter using a first
modulation scheme to obtain first data symbols;
performing the first transmission by transmitting the first
data symbols over a first diversity branch to the receiver;
modulating said data packets at the transmitter using a
second modulation scheme to obtain second data symbols;
performing the second transmission by transmitting the
second data symbols over a second diversity branch to the
receiver;
demodulating the received first and second data symbols at
the receiver using the first and second modulation schemes
respectively; and
diversity combining the demodulated data received over the
first and second diversity branches, wherein;
the second transmission comprises using the second
modulation scheme and a fourth modulation scheme and transmitting
the data modulated with the second and fourth modulation schemes
over the second diversity branch and a fourth diversity branch.

Claims 40 and 41 (Cancelled).

42. (Currently Amended) ~~The transmitter according to claim 40, further comprising~~ A transmitter for ARO re-transmission of data in a wireless communication system wherein data packets are transmitted to a receiver using a first transmission and at least a second transmission based on a repeat request received from a receiver, the transmitter comprising:

an interleaver or inverter to obtain different modulation scheme schemes;

a mapping unit that modulates data packets using a first modulation scheme to obtain first data symbols and modulates said data packets using a second modulation scheme to obtain second data symbols; and

a transmission unit that performs the first transmission by transmitting the first data symbols using a first diversity branch and performs the second transmission by transmitting the second data symbols using a second diversity branch.

Claims 43-47 (Cancelled).